

# HARRIER STRIKE MISSION™

Program written by Timothy Hays.  
Documentation written by Timothy Hays and Thomas Hennefer.

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## >>> CAUTION <<<

HARRIER STRIKE MISSION™ is designed to be started by simply inserting the game disk into the Atari disk drive, turning on the Atari ST system, Double-Click on the 'Floppy Disk A' icon and then Double-Click on the 'HARRIER.PRG' icon.

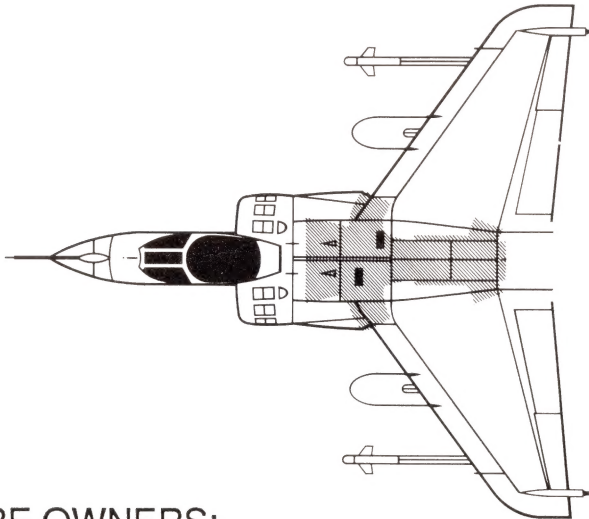
If you do not have the TOS in ROM installed in your computer, just boot (start up) your system from your TOS disk first (as you always do), insert the game disk into the Atari disk drive, Double-Click on the 'Floppy Disk A' icon and then Double-Click on the 'HARRIER.PRG' icon.

HARRIER STRIKE MISSION™ is designed to operate in the 'Low-Res' (16 color) mode and therefore requires a color monitor (Atari SC1224 or equivalent) or color TV (if your ST has an RF output).

If you are not operating in the 'Low-Res' mode, please pull-down the 'Options' menu (on the desktop) and select 'Low' for screen resolution before attempting to run the HARRIER STRIKE MISSION™ game.

HARRIER STRIKE MISSION™ is copy-protected. If you attempt to copy the disk, or disturb the desktop (directory) file in a manner other than described in this manual, you may destroy the file structure and the game will not run at all. If you should destroy the game, return only the injured disk along with \$5.00 (shipping and rewrite fee) to Miles Computing, Inc.

Our address is on the back cover of this manual. Be sure you include your address with the disk.



## STORE OWNERS:

HARRIER STRIKE MISSION™ has a built in demo mode which is easily operated by, inserting the game disk into the Atari disk drive, turning on the Atari ST system, Double-Click on the 'Floppy Disk A' icon and then Double-Click on the 'HARRIER.PRG' icon. No other assistance is necessary since the game will automatically start & run continuously through the demo mode. You may eject the disk and the demo will continue to run.

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# OPERATIONS ORDERS

\*\*\*\* ..... TOP SECRET YOUR EYES ONLY ..... \*\*\*\*

Good Morning, Commander. Since our aircraft carrier has arrived safely three miles off the enemy coast we can now inform you of your primary mission:

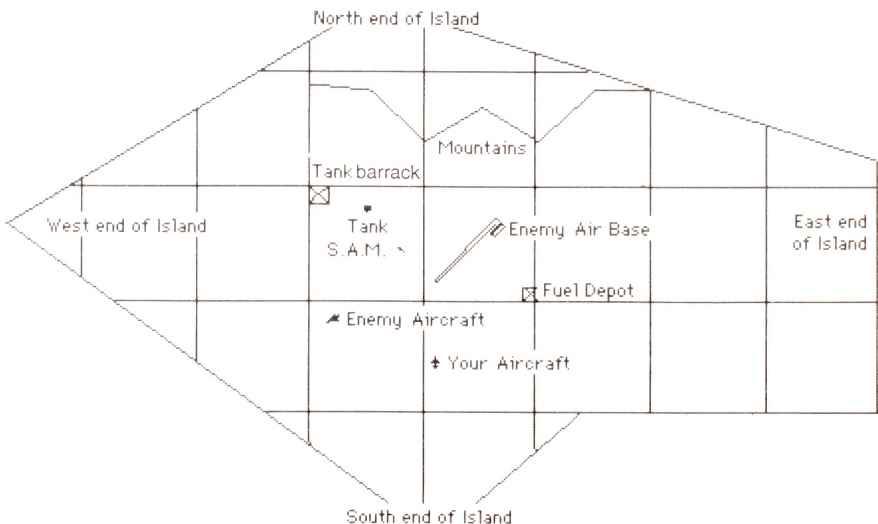
Intelligence reports the enemy has based on the island five of its most sophisticated fighter aircraft. These aircraft are armed with heat-seeking missiles, and can maintain an impressive speed delivery ratio very comparable to your own craft.

These fighters are based at the enemy's airbase located on the island, and one aircraft is always on constant patrol.

Current reports show that the enemy has a ground defense consisting of ten 'light armored' tanks for close support of the enemy airbase. These tanks are stationed in a Tank Tent located to the west of the airbase. These tanks are armed with surface-to-air missiles (S.A.M.'s), and one tank will always be on patrol. The enemy has also positioned a large fuel depot near the airbase.

Your orders, Commander, are to take control of the island, destroy the enemy ground forces and aircraft, also any and all military facilities located on the island, and either land and hold the island or return to land on your aircraft carrier. See intelligence photo of the island for a readout of your targets. The aircraft carrier is located directly south of this island.

Good luck, Commander.





# YOUR HARRIER JUMP JET

While playing Harrier Strike Mission™, you will be piloting one of the most advanced modern fighter aircraft ever designed, the Harrier Jump Jet.

Not only does your Harrier have the ability to fly at speeds up to Mach 1 (Mach 1 is the speed of sound, approximately 740 mph), but has V/STOL (Vertical/Short Takeoff and Landing) capabilities which allow the Harrier to maneuver much like a helicopter. This action also includes a hovering technique which combines stability with versatility unlike any conventional fighter craft.



## Your Harrier's Armament:

**30mm Aden Cannon:** Your Harrier has two 30-millimeter Aden Cannon, one of today's most powerful aircraft weapons. The cannon fires in burst rounds and is used to destroy other aircraft as well as ground targets, but CANNOT shoot down enemy missiles. To fire the cannon just press & hold down the left mouse button. You will see tracers from both sides of your undercarriage representing the path of your shots. There is no set maximum number of shots and the effective range is about 1 mile. If you have multiple targets lined up in your sights, it is possible to destroy several targets with a single shot. Accuracy varies depending on your firing angle/distance as well as the incremental movement of the enemy. There is also some natural drift involved. This means that your shots will not always make a direct hit, or may require two or three hits to destroy a target. This also means that your shots may drift and hit a target slightly out of your firing zone. Once in a while, you may be directly on top of a target and not see it on your screen, firing your cannon may destroy this unseen target.



**Sidewinder Missiles:** Your Harrier is armed with three Aim-9 'Sidewinder' air-to-air missiles mounted in triangulation on the undercarriage of your Harrier. These missiles are infrared heat-seekers and guide themselves to the nearest extreme heat source which in this case is your enemy's jet exhaust.

Missiles are deployed one at a time. You do not have to aim the missile, just press the 'M' key or the right mouse button to launch a Sidewinder and kiss the enemy aircraft goodbye. When the missile is launched, the box marked 'MISSILES' (on your control panel) will update and the message 'Missile Launched' will flash until the missile hits a target. Sidewinder missiles generally have a range of about 20 miles (36 km), however the enemy aircraft is always within this range, so you effectively don't have a limited range on your missiles.

While your own missiles will not seek your exhaust because of a radio coding device (Identify Friend-Foe, eg. IFF), be advised that surface-to-air and ground-to-air missiles fired at you are just as accurate as your own and should be avoided at all costs.



Space Bar

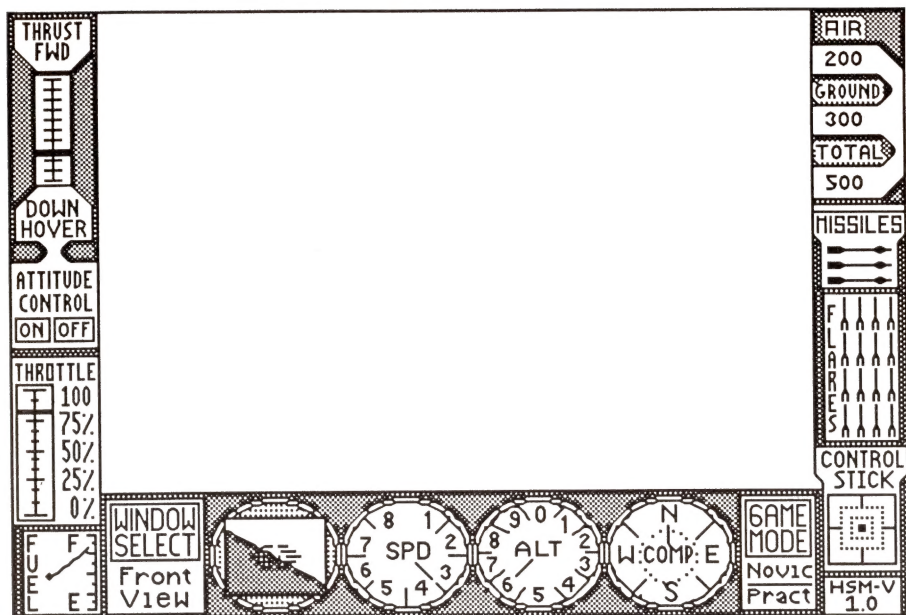
**Flare Deployment:** Flares are used when your enemy has launched a heat-seeking missile at you. When these flares are launched (you have 16 total), they emit a tremendous heat signal (infrared source) which attracts the enemy's missile to the flare rather than to your Harrier. Flares are deployed one at a time. Dropping a flare is initiated by pressing the 'Space Bar'. This will update the box marked 'FLARES' (on your control panel) until the flare has hit the ground.

If you do not launch a flare in time, you will be destroyed by an incoming missile. However, if you launch a flare too soon at a low altitude, the flare will hit the ground and disappear before the missile has reached the flare. When this happens, the missile will now track your Harrier. You CAN launch another flare, but this method will just waste your flares in a hurry. It is therefore recommended to make sure you have plenty of altitude to efficiently evade a missile by deploying a flare.

When the enemy fires a missile at point blank range, you will receive little or no advanced warning. Our best advice is to conserve your flares and try to maintain a comfortable distance between the enemy and yourself.

When you have successfully evaded a missile using a flare, the message 'MISSILE EVADED' will flash on the top of the screen (H.U.D, Heads Up Display), the flare and missile will disappear, and the score box will update giving you 25 (air) points for evading a missile with each flare. If you have another in-coming missile alert, you must deploy another flare.

**Your Instrument Panel:** Your Harrier Jump Jet is equipped with the latest in high-technology instrumentation which is projected on the famous 'Heads-up display' (H.U.D.) currently used in all state-of-the-art aircraft. The H.U.D allows you the pilot to direct full attention on the objective target while maintaining a constant monitoring of the Harrier's vital aerial statistics.



### 'WINDOW SELECT' Indicator:

Displays the current viewing direction of the window. You can select Right View, Left View, Aft View, Top View or back to Front View, by pressing the key for the letter shown underlined.

The 'Top View' mode is your Harrier's equivalent to a Radar display, with the exception that you will see your own Harrier on the screen. In this mode, you may **ZOOM** in or out by pressing the '-' or '+' (minus or plus) keys respectively. You do not have to hold down the 'Shift' Key or press 'Caps Lock' for any Shift-Key operations.

When the selected direction is other than Front view, you may use the artificial horizon in order to fly by instruments only.



### Air Speed Indicator: 'SPD'

This instrument tells you the current air speed of your aircraft from 100 to 800 miles per hour. The readout shows 1 to 8, simply multiply this number with 100 to get your airspeed. Since this indicator functions by measuring the air velocity passing your aircraft, it is not accurate at speeds under 100 mph. Your aircraft has a top speed of 800 mph (1.12 Mach). This indicator is therefore pinned at 100 and 800 mph.





**Altimeter: 'ALT'** This instrument informs you of your present altitude in thousands of feet, with a maximum ceiling of 10,000 ft.



**Compass: 'COMP'**

Shows your aircraft's current heading. If you're heading North and you pull up in a loop, your heading will switch to South as soon as you head over the top into an inverted attitude. You can easily see this by watching the compass as you pull back on the control stick. The compass will let you know when you have reached a 'straight-up' attitude by flipping the needle over 180 degrees. The compass indication will constantly change as your Harrier advances through a turn (change of heading). This is an electronic compass and therefore has no lag or error due to high-G forces or vertical attitudes. If you are between the aircraft carrier and the island, the island will generally be to the north, and the aircraft carrier to the south. The compass is useful if you have flown off one of the ends of the island, to indicate when to pull out of a turn, once your aircraft has turned around 180 degrees.



**Attitude Indicator (Artificial Horizon):**

This indicator shows your present attitude (the direction your plane is facing relative to the earth).

The solid line in the middle represents the horizon. This indicator is useful when you are not sure where the ground is relative to your plane, such as when you have switched the viewing window to 'Top-Down'.

The artificial horizon is a programmable electronic display (see 'New Options' for changing display) and therefore has very little lag or error due to high-G forces.





### **Fuel:**

Indicates fuel remaining in tanks. Fuel is normally indicated in aircraft as pounds, but this indicator has been simplified using 'E' denoting 'Empty', and 'F' for 'Full'. Make sure you have enough fuel to return and land on your aircraft carrier (1000 bonus points for Novice and 1500 for Expert). If you decide that you don't have enough fuel to return to the carrier, attempt a landing on the island and receive 500 bonus points for Novice or 1000 in the Expert mode.

When you run out of fuel the throttle will drop rapidly. It is possible to make an emergency landing as long as you are at a low altitude. Since your Harrier's powerplant (engine) powers the attitude control and the hydraulics, you will lose all control over the aircraft when the throttle power output drops to about 25% or less. This is also true if you manually lower the throttle. Remember that the higher your throttle, the faster you will exhaust your fuel supply.



### **Missiles:**

At the start of the mission you receive three heat seeking missiles. Missiles are fun and easy to use, but maximum scoring occurs when you use only your cannons. Missiles are launched with a press of the 'M' key or the right mouse button.



### **Control Stick:**

Your Atari ST mouse acts as the control stick of your Harrier Jump Jet. Whenever we refer to the 'control stick' in this manual, we are referring to the movement of the mouse. Moving the mouse back (toward you) is the same as pulling back on a control stick, which causes your jet to climb. Moving the mouse to the right is identical to moving the control stick to the right, and so forth.

The 'feel' (simulation) of the mouse in the Novice mode is different than the 'feel' in the Expert mode. The Novice mode uses auto-coordinated rudder/aileron flight and the Expert mode is a simulation of actual jet flight where you must bank over and pull back on the control stick to make a turn.

For a more in-depth explanation about flying read the section entitled: 'FLIGHT CONTROL USING THE MOUSE'.



### **Flares Indicator:**

Represents the number of your flares your Harrier has remaining. You start your mission with 16 flares. Pressing the spacebar launches one flare at a time.



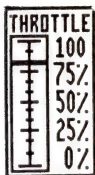
### **Thrust:**

The THRUST control must not be confused with the THROTTLE control. The Harrier has four jet nozzles (see illustration, page 11) which in normal operating mode face downwards causing the thrust of the jet to maintain a hovering attitude, but can also be redirected aft which causes the Harrier to be propelled forward. Pressing the '>' key will direct your nozzles to the rear for forward thrust. Pressing the '<' key will direct your nozzles down for vertical (hovering) operations. These two control keys will have the immediate effect of being a speed control. Thus, the further advanced your thrust control, the higher your airspeed will be. This is not really a speed control, but a 'thrust vectoring' control. You can move your nozzles from the full down position to the full aft (rear) position, causing full forward thrust. At this position you will now have implemented your full capable forward speed. Moving the thrust back to the down position will have the effect of slowing down the aircraft and initiating a hover. The nozzles are used in this manner to redirect the thrust and give you the capability of maneuvers that are impossible for any other conventional aircraft.

When executing a takeoff, the capabilities of the Harrier allow you to determine your angle and direction of movement. This action is initiated by increasing the throttle (the '}' key) to 75% and then advancing the forward thrust (the '>' key) until the Harrier has achieved the desired rate of speed. You can only advance your thrust if the throttle is advanced to 55% power or greater. This is because your aircraft requires more than 55% power to maintain a hover.

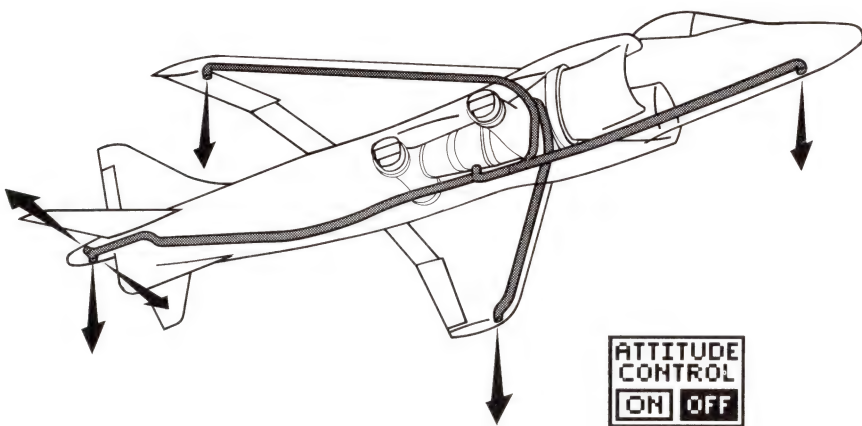
An inadequate combination of thrust and throttle may result in a loss of sufficient altitude and cause your Harrier to explode before you have cleared the carrier.

If you are flying inverted (upside down), do not lower your thrust control until you have turned over (right side up), or you will end up thrusting your Harrier straight down toward the ground.



### **Throttle:**

The THROTTLE control must not be confused with the THRUST control. The throttle control panel readout designates the percentage of power engaged at the present time. During normal (conventional) flight your throttle should be at 75% power. You may want to raise your throttle more than this when you are first learning how to fly. This will have the effect of compensating for the lost altitude when you are in a turn, but will increase your altitude when you are flying straight and level at low airspeeds. The higher your airspeed, the less apparent effect the throttle will have on your vertical lift. A higher rate of throttle will affect the amount of fuel being used.



### **Attitude Control:**

The attitude control and hold system is actually easy to use, but requires a thorough understanding of what it is in order to take advantage of its abilities. It has been termed 'The Helicopter Hover Mode' which we will now describe.

Whenever your four thruster nozzles are aimed downward, you will be hovering and will AUTOMATICALLY be under Attitude Control (indicator displays 'ON'). Attitude control is AUTOMATIC and will keep the aircraft in a steady position in space and still allow you to pitch and turn



(without banking) the aircraft. This is useful if you wish to stop dead in space and spin around to fire at the enemy.

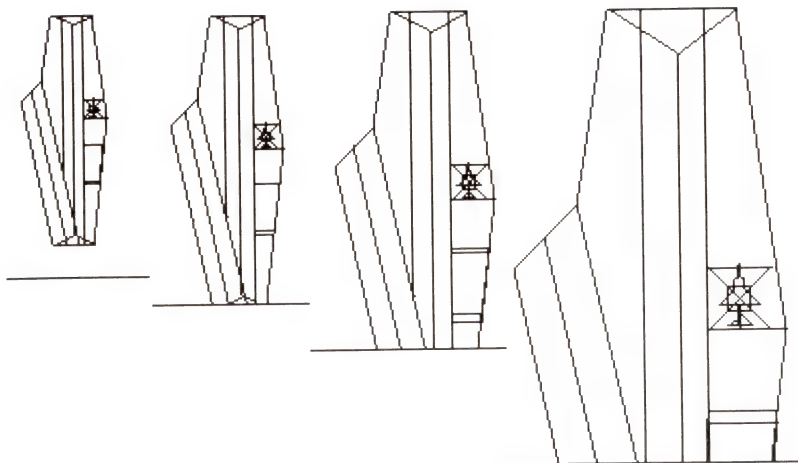
If you are maintaining a hover, and then advance your forward thrust control (the '>' key) you will now be moving forward (indicator displays 'OFF') at the speed shown on your air speed indicator, and any movement of the mouse will effect the pitch or bank attitude of the aircraft since you are now in conventional flight. If you move the thrust control down (the '<' key) you will automatically switch back into Attitude Control as soon as you have stopped forward motion (to maintain a hover). Once the attitude control system switches in, your aircraft will automatically level-out (roll-over) into a non-banked attitude. You can easily see this by the starting practice mode. Bank your aircraft a few degrees, then press the '<' key to turn the thrust down and initiate hovering attitude control; you will immediately notice the horizon straightening out and the aircraft will soon be level in relation to the forward horizon. You may still pitch up & down and turn left & right all you like, but attitude control will keep the aircraft from drifting and rolling (banking-over).

Once the attitude control has been engaged, and you are hovering at least 20 feet over the ground, the following will occur: when you move your control stick to the left or right, the aircraft will turn (rotate & change heading) in that direction. Your aircraft will NOT bank until attitude control is disengaged (you have forward movement). You can spin around all you like, this is useful for aiming your Harrier in the desired direction without banking. Pushing your control stick forward will pitch your nose down, but you will not lose altitude since the attitude hold system is in effect. You can pitch down approximately -86 degrees. When you are pitched over, you can also turn the aircraft right or left, but the attitude hold system will not allow you to pitch over more than about -86 degrees. The same goes for pitching up. For example, if you were able to pitch over (either direction) more than 90 degrees you will turn upside-down, and obviously you cannot hover in an upside-down attitude. This is why the attitude control & hold system will limit you in the amount you can pitch up or down. If you pull back on the control stick while under attitude control, you can only pitch up to about +86 degrees. If you try to engage the attitude control system (put your aircraft in a hover) while upside-down, you will quickly fall to the ground and destroy your Harrier.

The attitude control and hovering system also has other side effects which can be used to your advantage. With a little skill, it is possible to perform tail skids by moving slowly forward as you are hovering with a nose-up attitude.

Note: If your thrust is aimed mostly down (but you are still moving forward), and you pull up into a climb, you will quickly lose altitude unless you redirect your thrust forward (press the '>' key).

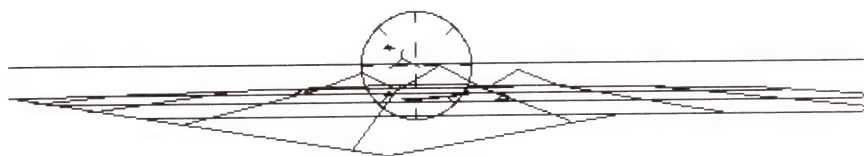
Attitude control is necessary for vertical takeoffs and landings.



## YOUR AIRCRAFT CARRIER

The carrier is your home base. At the start of your mission you'll begin on the deck of the carrier, take off and fly to the island, carry out your primary mission and finally return safely to the aircraft carrier. Sounds easy doesn't it? It takes a lot of practice!

You may land anywhere on the aircraft carrier using the standard 'Flare-Out' technique, or using any of the several V/STOL landing techniques. Be sure to conserve enough fuel to allow for last minute maneuvers in and around the carrier. It's a shallow victory to total up lots of points and then run out of gas on the way home. Not to mention explaining it to the First Sea Lord!



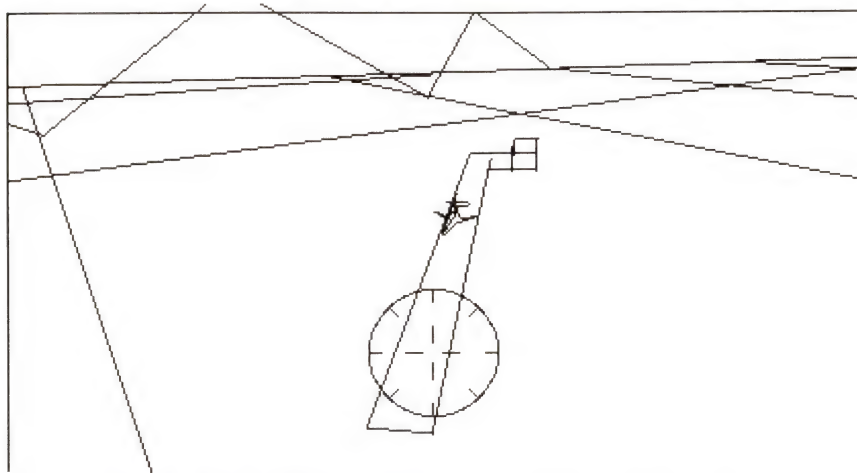
## THE ISLAND:

The island is about 3 miles due north of your aircraft carrier. The island is about four miles across, three miles long and has three mountains near its northern perimeter.

As you progress in your ability to control your Harrier and to strike back at the enemy, you will most likely perfect your favorite approach to the island. For the novice, may we suggest gaining sufficient altitude and increasing throttle for safety. You thrill seekers may apply the full thrust flat-on-the-deck approach at an altitude of not more than 600 ft.

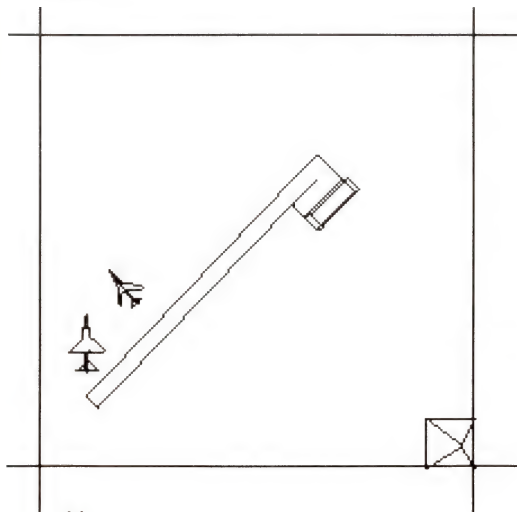
# The Enemy's Forces:

The enemy forces on the island will shoot first without warning. Your mission: Terminate these forces as safely as possible.



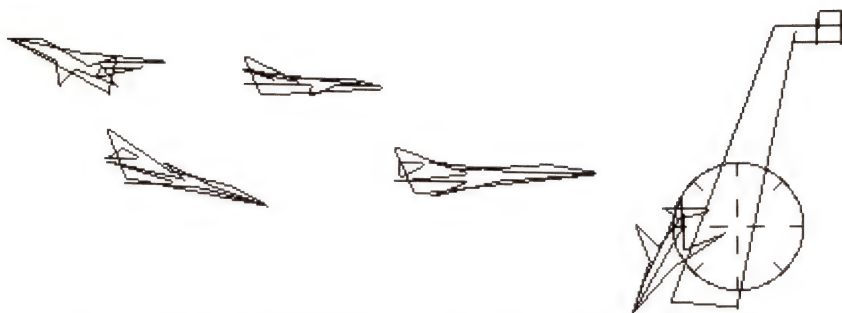
**Airstrip and Headquarters:** The enemy airstrip and headquarters are located near the center of the island. Inside the hangar are housed five fighter planes and the island's General Headquarters (G.H.Q.).

The building doesn't attract missiles, so the headquarters must be destroyed with your Aden Cannon. You will get 100 points for destroying this building, but to gain more points do not destroy the G.H.Q. until all of the enemy's fighters have been deployed. This same guideline applies to the tanks and their deployment also. Basically, the longer you stay in combat, the more difficult it becomes and the scoring system is based on this.



**FUEL DEPOT:** The enemy fuel depot is located about half a mile south-east of the headquarters & airstrip. This depot is located in a tent (pyramid shaped) and you receive 75 points for destroying it.



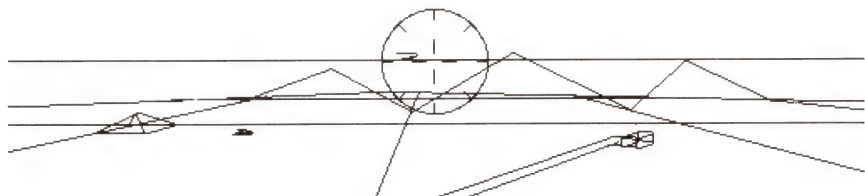


**Five Enemy Interceptors:** Since the enemy has detected your aircraft carrier's presence, they have scrambled their island's forces. So 'heads up' because one of their planes will be in the air most of the time, and these pilots have only one thing in mind--to find you and flame your tail!!

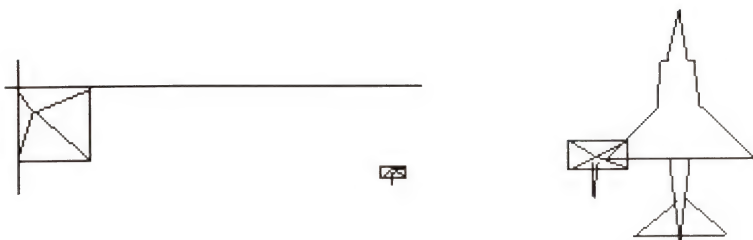
The enemy will detect your presence from the moment you start playing the game, will constantly monitor your Harrier's course and open fire at the most opportune time. These planes carry heat-seeking missiles which are a little bit slower than yours and have a limited range of approximately 6.5 miles.

If you destroy an enemy aircraft while it is taking off from the airstrip you get just 50 points, but if you destroy an enemy plane in combat you receive 100 points for a missile hit or 200 points for using your cannon (obviously more difficult).

It may seem tempting to attack and destroy the hangar/G.H.Q. early in the game, but remember that more points may be earned if you destroy all the enemy planes first, and then the hangar.



**Tank Barrack:** Located about three quarters of a mile west of the airstrip is the enemy's second line of defense. This station holds up to 10 'light armored' tanks.



**Tanks:** As one tank is destroyed, the next will appear out of the tank barrack (as long as it has not been destroyed). Tanks will move slowly along the ground to the east or west, tracking the direction of your aircraft. The tanks are armed with S.A.M. (Surface to Air Missile) heat-seeking missiles which are slower than the standard air-to-air missiles but effective at close range. When a missile is launched, the message 'Ground Missile Alert' will flash.

The ground-launched S.A.M. has a limited range of about 5.5 miles, this range is just short of the distance to your carrier. If you are still on the carrier (or otherwise out of range) when the S.A.M. is launched, the missile will die off and disappear before it reaches you and the warning 'Ground Missile Alert' will stop.

If you are within the missile's range, you may be destroyed unless you evade a missile by deploying a flare, or initiate a 'S.A.M. Break' (more on this technique latter).

You will receive 50 points for each tank you destroy, and 75 points for the tank barrack. The same game theory applies to the tank barrack as it did for the aircraft hangar. If you destroy the tank barrack then you have destroyed the tanks within it, and therefore won't have any more tanks to contend with. But, you'll end up with a lot more points by destroying all ten tanks before destroying the tank barrack. Still with us? GREAT!

## KEYBOARD CONTROLS



Make sure the **Caps Lock** key is not locked down.

Only one keyboard command will work at a time.

**Backspace** Resets the HARRIER STRIKE MISSION™ game.

**[0] [1] [2] [3] [4]** Volume controls. Default is 2




0 Quit game.

**F** Forward View.

 Aft View.

**R** Right View.

**L** Left View.

 Top View.        Zoom IN & OUT respectively when in the Top View mode

**D** Day/Night mission toggle switch.

**P** Pause mode. Press any key or **Click** to continue.

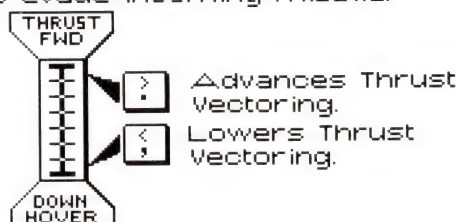
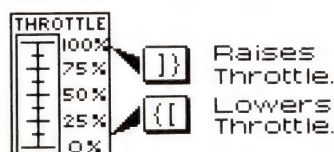
**S** Score. Displays point breakdown & PAUSE mode.

**B** Brakes. Use this key when landing to slow down.

**M** Missile. Launches 1 Aim-9 Sidewinder missile.

Space Bar Drop 1 Flare to evade incoming missile

Fires cannon.





# GAME PLAY

Well, now that you know what your mission is, and what you're up against, are you ready to give it a try?

Put your game disk into the disk drive, turn on your Atari, disconnect the phone and get ready for your first Harrier Strike Mission™! (Dramamine and air sickness bags are optional).

You will be greeted with an Options Screen. You can choose 'Day Mission'/'Night Mission', 'Practice Flight', 'Novice'/'Expert' and click the 'Start' button to start. Or, click on the 'Flip' button for another screen of options.

If you wish to quit playing Harrier Strike Mission™, just press and hold down the 'Q' key. The only exception to this is when you are in the 'High Scores' function, just enter your name, click 'SAVE', and then press 'Q'.

At any time during the game, you may display the current score breakdown (and pause the game) by simply pressing the 'S' key, or, pause the game with the 'P' key. The 'Backspace' key is for Reset.

A unique feature of this game is the Sound Mixing capability. Sound Mixing can be controlled by adjusting the volume level of the background sounds (engine noise, warnings, etc.) using the '1' to '4' keys & '0' for off, then adjusting the volume control on your monitor (or TV) for the foreground (and overall) running sounds (launching your missiles, cannon shots & explosions). The default is 2.

## DAY OR NIGHT MISSION:

Harrier Strike Mission™ gives you two different flight conditions, day or night. The game is preset to daylight conditions, complete with sun. If the sun should appear in the center of your screen, your climbing angle is 90 degrees (heading straight up). You must advance your thrust greater than 200 knots during this maneuver to keep from stalling out.

If you desire to fly at night, just select the 'Night Mission' button while in the game options, and the course will be set for night maneuvers complete with stars to guide you. In case you want to change mid-flight to either of these two modes, just press the 'D' key to toggle between 'Day Mission' or 'Night Mission'.

There is slightly more scenery in the night mode, which will run at slightly slower frame rates than the day mode.

**Demo Mode:** If you don't touch your mouse or keyboard, Harrier Strike Mission™ will automatically run the 'DEMO MODE', and play through an entire mission by itself. If you *have* touched the mouse or keyboard to attempt starting the game then you're pretty brave because we haven't told you how to control your Harrier yet!

You may select either 'Day Mission' or 'Night Mission' to watch the Demo mode in, just click the 'Demo Flight' button and the game Demo will start. We recommend watching the demo mode to familiarize yourself with the game before you attempt a mission.

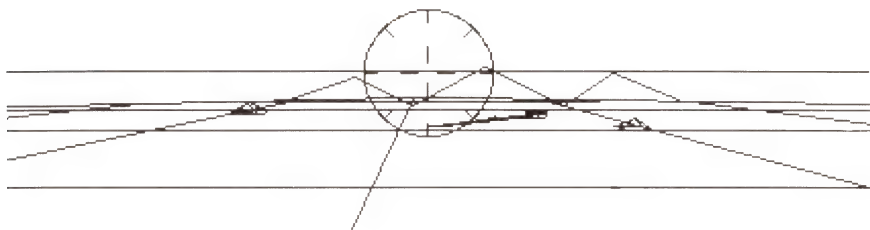
It is also fun to watch the effects of the various 'New Options' (by selecting 'Grid' for instance) before selecting demo mode.

# OPTIONS:

## LEVEL OF DIFFICULTY:

Harrier Strike Mission™ has two levels of difficulty: NOVICE and EXPERT. The level of difficulty you choose will be shown in the 'GAME MODE' indicator. The NOVICE mode simplifies flying control on the mouse by giving you auto-coordinated flight in all maneuvers. The NOVICE mode does not allow for advantageous maneuvers such as 'barrel rolls'. The advanced flying techniques of the EXPERT mode will be discussed later in this section.

As you destroy one enemy aircraft, the next will fly faster and launch missiles more often. The tanks also launch missiles more frequently. If you selected Novice mode, the enemy aircraft will generally fly from slow to medium. In the Expert mode, however, the enemy aircraft will start out fast, and each successive aircraft will have a faster base speed.



## PRACTICE:

Because of its sophisticated flying ability, the Harrier can be more difficult to fly than a conventional fighter aircraft. At first you should select the 'PRACTICE FLIGHT' option using the NOVICE mode, which allows for much easier piloting of your aircraft.

Selecting 'Practice' will display 'Pract' in the 'GAME MODE' Indicator. Playing the game using the 'Practice' mode will NOT save your scores on disk. The 'Practice' mode allows your aircraft to be destroyed and still allows you to continue playing the game. Your aircraft will continually regenerate itself. When you are destroyed, the message 'Harrier Destroyed!' will flash on the top-left corner of the screen, and your Harrier will stay at this altitude during the explosion. If you switch to 'Top View' ('T' key) you will see your aircraft being destroyed and then re-appear again. If you crash into the ground, you will simply bounce on the ground and still be able to pull-up (gaining altitude) and continue. If you cannot get back off the ground, it is probably because you need to advance your throttle and/or thrust controls, or your Harrier is banked and/or pitched over too far. If this happens, and you cannot regain control over your aircraft, you can always reset the game ('Backspace' key).

The 'Practice' mode will start you out at 550 feet (but gaining altitude), above the south end of the island, at 137mph (just above stall speed). This allows you to practice banking & turning and generally getting the 'feel' of your Harrier Jump Jet.

The throttle starts out at 90% power, which is the recommended level for practicing.

## HORIZONTAL LANDINGS:

There are basically two types of horizontal landings you can perform in your Harrier; a 'V/STOL assisted' landing, and a standard 'flare out' type of landing.

### PERFORMING A 'FLARE OUT' LANDING:

A 'flare out' landing is the standard landing method used in most conventional aircraft, where the aircraft makes a downward sweeping curve over the landing area and then pulls up the nose of the aircraft and lowers the throttle, slowly losing altitude and air speed and landing with the tail landing gear down first. This method of landing is difficult to illustrate and can be harder to perform than the 'V/STOL assisted' landing.

If you do use this method, make sure you remember to lower your throttle immediately when you touch-down to insure that you don't 'bounce' and end up just initiating a 'touch & go'. When you have landed, the appropriate message will blink on the screen. At this point you must press the 'B' key for ground braking, or the '<' key to lower your thrust vectoring and therefore stop forward motion.



### PERFORMING A 'V/STOL ASSISTED' LANDING:

A 'V/STOL assisted' landing is shown at the end of the demo mode, where you lower throttle and lose altitude while keeping a 'straight and level' attitude of your aircraft. This allows the Harrier pilot to see his final touchdown point at all times, and is the method most often used (and preferred) by Harrier pilots.

To perform a V/STOL assisted horizontal landing, first line up your target landing area directly in front of you and level out your aircraft. Simply lower your throttle control ('{' key) until you just start to lose altitude. The throttle should generally be greater than 50% to perform a safe landing. If you land and your aircraft bounces and starts moving upwards (or hovers), you have too much throttle to land and you simply need to reduce your throttle a bit more (press the '{' key some more) in order to finish your landing.

An easy way to see this type of landing is to select the 'Practice' mode, click 'Start' and immediately lower your throttle control ('{' key) to just above 50% power. Keep your aircraft in straight & level flight. This will gently bring your aircraft to the ground. You then need to brake ('B' key) until you have stopped, and you will have just performed a 'V/STOL Assisted' landing.

## INFORMATION ON ALL TYPES OF LANDINGS:

You do not have to worry about landing gear in this simulation. Just be assured that they are down when you need them.

You must NOT be banked or pitched over more than 15 degrees in any direction when you land or your Harrier will exceed structural limits and be destroyed.



## NEW OPTIONS FOR ATARI ST:

The original hit version of HARRIER STRIKE MISSION™ on the Macintosh did not have many of the features and options as in this version of the game. Here is a summary of these new options.

There are two color-shade options shown on the main options screen. These options are used either to increase the visual effect (select 'OK' to shade), or increase the frame-rate processing speed (select 'NO' to turn off shading).

There is a unique button marked 'FLIP' on the bottom right of the selection page. Click on this to get another page of options. Note: if you don't select anything, after about 25 seconds it will flip back automatically.

The first set of new options on the second page is called 'Frame Rate Speed Options'. Selecting 'OK' for 'Enhanced Horizon' will add a set of dots around the horizon which will allow you to see some scenery moving in the main window when all other scenery is behind you. This also helps when you are flying inverted, the dots tell you which side of the horizon line the ground is. Try flying without this option (the game runs faster) and you will soon get the idea.

You can also program 3 modes of operation for the artificial horizon, 'Fill-in', 'Line-only' or 'Empty'. Selecting 'Empty' turns off the artificial horizon and speeds up the game.

The 'Show Gunsight' option can be useful if you want to just fly around with no combat. Just select 'NO'.

The next row is called 'Specialty Options'. On the Macintosh, many Harrier fanatics wanted a non-combat flying mode where you could just fly around without getting blasted out of the sky. We took this one step further by adding these three options. 'Peacetime' just excludes the enemy from firing at you so you can fly around without getting shot at. 'Unlimited fuel' allows you to fly forever. The 'Grid' option changes the scenery to a ground-grid network and removes the island, carrier, planes, etc. for stunt flying around different scenery.

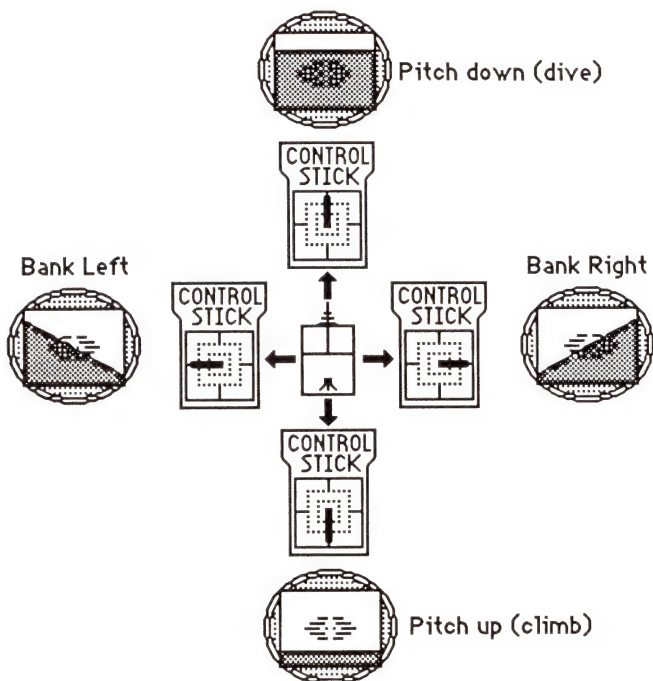
The third row is 'Control Options' and affects the control stick. Sensitivity can be set at 'Beginner', 'Standard' or 'Stunt'. The 'Stunt' option is very sensitive, allows for very quick turns and is generally used in high-speed stunt flying at high altitudes. The 'Double Speed' option effectively doubles the rate at which you are flying. If you select 'OK' for 'Double Speed' and the Air Speed indicator displays 8 (for 800mph) you are now flying at 2.24 Mach! (1600mph!)

The last row allows you to set the enemy aircraft flying speed at 'Slow', 'Standard', 'Double', 'Triple' or 'Quadruple' (WOW!).

You can create some very unique scenario effects by mixing these options.

If you wish to fly with the fastest obtainable frame-rates and flying speeds, just set the options in the following manner: Ground='NO', Plane='NO', Day Mission='OK', Practice='OK', Novice='OK', ('FLIP' page forward) Enhanced Horizon='NO', Empty='OK', Show Gunsight='NO', Peacetime='OK', Unlimited Fuel='OK', Grid='NO', Stunt='OK', Double Speed='OK', Quadruple='OK' ('FLIP' page back). Then select START, and increase your throttle and thrust to maximum. Very high frame rates are now obtainable. Now, just destroy all the enemy targets to see just how fast this Harrier can fly!

If you would like to try some super fast dog-fighting (using just your cannons) set 'Peacetime'='NO' after selecting the options to the above settings, destroy all the enemy ground targets except the headquarters, increase your throttle and thrust to maximum and get ready for an extremely difficult (but exciting) high speed chase.



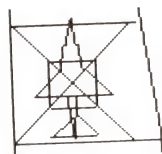
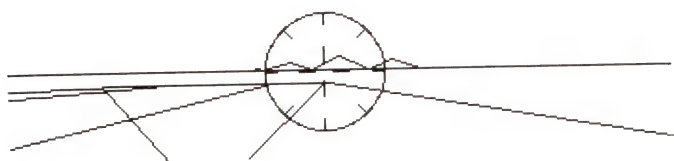
### **FLIGHT CONTROL USING THE MOUSE:**

The NOVICE mode greatly simplifies the standard flying controls by adding an auto-coordinated rudder to the control stick. The mouse is used as your control stick. Just move the mouse forward to pitch your nose down and put your aircraft into a dive (see illustration). You can see the 'CONTROL STICK' on the instrument panel echo the mouse movements. If you move the mouse straight back (toward you) the aircraft will pull up and out of a dive. If you leave the mouse in this position you will pull your aircraft through an inside loop. Whenever you move the Control Stick forwards or backwards, you must center it to come out of the loop. If you move your mouse to the left, you will bank and turn to the left. Thus your rudder and ailerons are both coordinated by your Control Stick. You must move your Control Stick back to the right and then center it in order to come out of the turn. The point is that aircraft controls are pressure rate oriented, and are NOT immediate (absolute) controls as those in your family car. If you bank into a turn, you must bank the

opposite direction to pull out of the turn. If you are in 'straight and level' (relatively slow) flight, and you bank over more than a few degrees, you instigate a slow downward spiral. This is to point out that you will lose altitude quickly when you are in a bank (turn) unless you increase throttle & thrust for more lift. The best way to become familiar with this is to try it under the PRACTICE option.

In the EXPERT mode you don't have any control of the rudder. This is the true mode of jet aircraft flying, since the rudder is little more than a stabilizer at high speeds and doesn't turn the aircraft. In order to turn in the EXPERT mode, you must first bank over either right or left and then pull back on the Control Stick (pitch up). Watch the compass and the scenery as you pull through a turn. This mode of flying allows for great aerobatic control. You can do barrel rolls easily, as well as inside and outside loops at any angle! As one pilot said about HARRIER STRIKE MISSION™, 'I know the aircraft can do that, but I doubt the pilot would survive!' There are many such maneuvers you can accomplish with this simulator, just make sure you have plenty of altitude first.

If you fly out of the boundaries of the playfield more than about 30 miles from the island, you will fly off the edge of the universe and appear on the other side (as well as the enemy aircraft). So, if you fly north past the island, and see the island disappear in the 'Aft View' ('A' key), switch to the 'Forward View' ('F' key). The island will now be in front of you. The same goes for flying off the east end of the playfield: you will appear on the west end of the playfield.



## TAKEOFFS:

### INFORMATION ABOUT ALL TAKEOFFS:

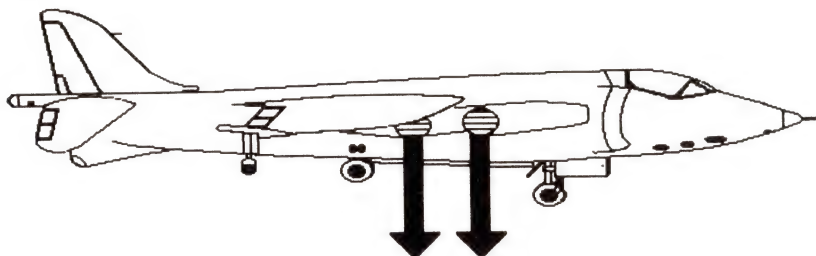
When you choose to play a game by not selecting the 'Practice' option, you will be electing to initiate a takeoff. Once you click the 'Start' button, you will see the forward view of your Harrier as you sit on top of the aircraft carrier. To get a better idea of this, just switch to the 'Top View' (the 'T' key) and zoom in ('-' key) to see your Harrier on the center of the helicopter takeoff/landing pad. Shift back to the 'Forward View' (the 'F' key), and you will note the 3 mountains on the island approximately 3 miles in the distance.

You start out with the engine on and the throttle at zero. To initiate a takeoff, you must first advance the throttle ('J' key). As soon as you have advanced the throttle, the attitude control system will turn on. However, you do not have enough engine output for the attitude control system until you have advanced the throttle to at least 20% power. At 20% power or above, the attitude control system will allow you to rotate (turn) around on the deck of the aircraft carrier. This is so you can taxi to another takeoff point, but your harrier will only move forward when you have at least 55%



throttle and advance the thrust control ('>' key) at least one unit.

Before attempting any of the following takeoffs, make sure that your control stick is centered.



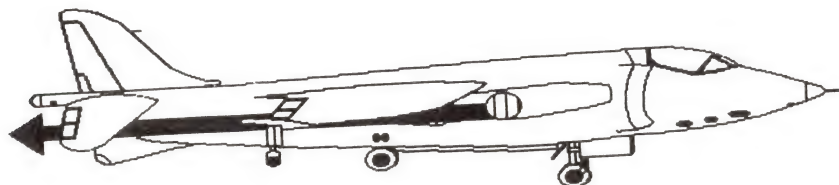
### PERFORMING A VERTICAL TAKEOFF (V/STOL):

This is the most simple type of takeoff to perform. Start anywhere on the deck of your aircraft carrier. Do not advance the thrust control. Just advance the throttle ('I' key) to greater than 80% power. You will immediately be lifted up into the air. You are now hovering over your aircraft carrier and gaining altitude. Continue gaining altitude until you want to move forward. When you first advance your thrust control ('>' key) you will still be gaining altitude. You can leave the throttle at this level to compensate for altitude lost during banks and other maneuvers, or you can lower your throttle a little ('I' key) until there is no change in the altitude indicator, this will put you in straight & level forward flight.



### PERFORMING A V/STOL ASSISTED FORWARD TAKEOFF:

This takeoff maneuver is also very simple. Start anywhere on the deck of your aircraft carrier. Just advance the throttle ('I' key) to 80% and immediately press the the thrust control ('>' key) and your Harrier will raise up and move forward at a constant rate. You will quickly clear the front end of the aircraft carrier. You are now in straight and level forward lifting flight. This is the takeoff maneuver that is most often used in a short takeoff situation.

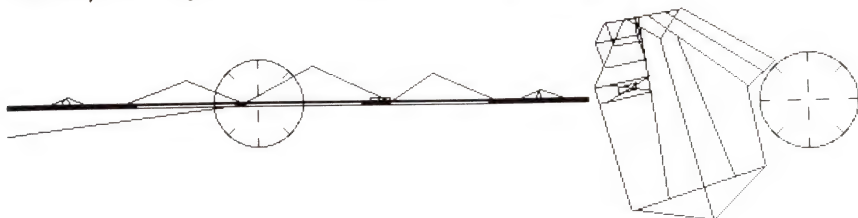


### PERFORMING A 'STANDARD' HORIZONTAL TAKEOFF:

This takeoff maneuver is the method used by most conventional aircraft, except that you still must advance your thrust vectoring control.

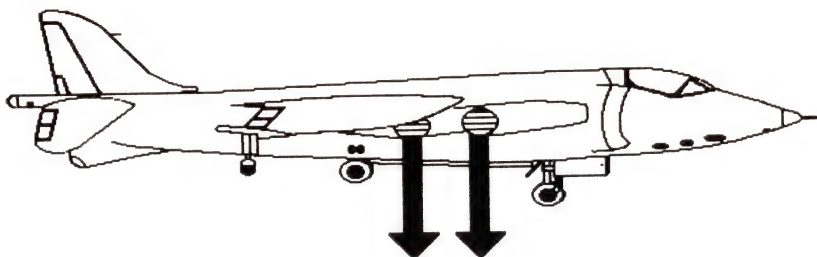


Start anywhere on the deck of your aircraft carrier. Now, just advance your throttle (the ']' key) to just 75% power. If you advance the throttle too far past the 75% power mark you will be in a vertical takeoff. Now that you are sitting stationary with 75% power, advance the thrust vectoring control (hold down the '>' key) which will immediately start your aircraft moving forward. Make sure you pull back on the control stick (to lift-off and gain altitude) before you clear the edge of the aircraft carrier.



## FINAL APPROACH & LANDING INSTRUCTIONS

The island's large area allows your calculations to be diverse, but landing on the aircraft carrier will demand a more definitive approach. As you approach the designated landing area you will need to level-out your aircraft. Because you're flying a Harrier you need not approach from any certain direction, but will need to be fairly level on touchdown to avoid a crash landing.



### **PERFORMING A VERTICAL LANDING (V/STOL):**

A vertical landing means you will hover over your landing area (such as the 'helicopter pad' on the aircraft carrier), and then lower your throttle thus losing altitude and gently setting your aircraft down on the ground.

To initiate a vertical landing, select the Top View ('T' key) to make sure you are directly over the area you wish to land. Reduce Thrust to zero ('<' key) to stop forward motion. Switch back to the Front View ('F' key) and level-out your 'pitch', the Attitude Control system will now hold the aircraft in this level position. Reduce the throttle control ('{' key) until you are losing altitude. Do not reduce throttle more than necessary in order to lose altitude, you may drop down too fast and cause a crash landing. The throttle should generally not be below 50% to perform a safe landing. Once you have touched down, the final score breakdown will be shown.

If you attempt a landing on the aircraft carrier, you do not have to choose a particular spot to land. Anywhere on the surface of the carrier will do fine.

Both landing areas, the island and the aircraft carrier are at the altitude of zero feet (sea level).

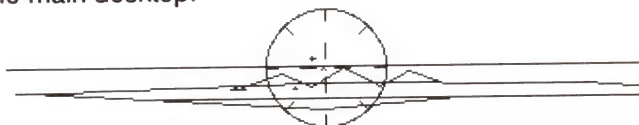
Once you are on the ground, moving the control stick left or right will not have any effect, since you cannot bank while stabilized on the ground. Pulling back on the control stick may pull you off the ground if you are over your stall speed. Pushing forward on the control stick may tip your aircraft over on it's nose and therefore destroy your Harrier.

After you have landed and stopped forward motion, the final scores will be shown along with any bonus points. The 'Score Breakdown' will show the air and ground points, but not the bonus points. Bonus points are only awarded if you successfully land, and are shown at the top of the screen. If you click the mouse, you may then select 'Return to game' or 'Save scores'. Selecting 'Save scores' will bring onto the screen the top ten high scores. Your score will NOT be recorded if you were playing in the 'Practice' mode.

### THE HIGH SCORES FUNCTION:

After you have played a game (not in the 'Practice' mode), have seen the scoring breakdown and selected 'Save scores', you will then be in the high scores function. If there are any other scores already saved on the disk, these scores will appear on the screen. This routine saves only the top ten scores. If your score is not within the range of scores on this screen, you cannot save your score, and you must press the 'OK' button to continue. If your score is one of the top ten, just type in your name & click the 'SAVE' button.

Your HARRIER STRIKE MISSION™ game disk has a folder on it called 'SCORES.HSM'. In this folder is a blank scores file called 'SCORES'. If you wish to eliminate the record of the scores kept on your disk, just copy this (blank) 'SCORES' file on top of your current 'SCORES' file on the main desktop.



### INITIATING A 'S.A.M. BREAK':

A S.A.M. break is used to break away from surface or air missiles. This advanced technique is difficult to accomplish. You must be flying at a speed greater than 550 mph in order to break the path of the incoming missile. The missile will track the shortest distance in order to destroy your aircraft. You can easily see this by switching to the 'Top View' mode ('T' key) when there is an incoming missile. Use the minus ('-') or plus ('+') keys to Zoom in or out.

With your airspeed set to at least 550 mph, wait until you see an incoming missile, then accelerate away from the missile. If the missile is still tracking you, accelerate and turn (or pitch) into a 90 degree angle away from the missile and break away from the danger. If you are flying at 800mph and heading away from the missile, you do not have to worry about the missile hitting you.

## **THE HARRIER & THE HARRIER II:**

The Harrier used in the Royal Navy was originally designed by Hawker Siddeley Aviation (now British Aerospace) of The United Kingdom. The Harrier that is currently in use in the United States is the totally redesigned McDonnell Douglas AV-8B Harrier II. This is to point out that these are two different aircraft. There are other versions on the V/STOL Harrier still in use such as the HSA Sea Harrier and the MD/H AV-8A (primarily used in Spain).

### **Specifications shown are for the United States Marine Corps AV-8B HARRIER II:**

**Type:** Single-seat, single engine jet aircraft for close air support and interdiction missions. Based at small fields, remote forward sites ashore; small or large ship operations at sea. Capable of Vertical or Short Takeoffs and Landings (V/STOL).

**Powerplant:** Rolls-Royce Pegasus 11 turbofan; Thrust 21,550 pounds; Internal fuel 7,759 pounds.

**Length:** 46.3 feet (14.1 meters)

**Height:** 11.6 feet (3.53 meters)

**Wingspan:** 30.3 feet (9.23 meters)

**Wing area:** 230 square feet (21.36 sq. meters)

**Takeoff Gross Weight:** 29,750 pounds (13,490 kg)

**Operating Weight Empty:** 13,086 pounds (5,935 kg)

**Takeoff Distance:** 0 - 1,500 feet (0 - 460 meters)

**First Flight (Development):** November 1981

**Crew:** One (AV-8B) and two (TAV-8B)

**Combat Radius:** 600-plus nautical miles

**Ferry range:** 2,000-plus nautical miles

(Air re-fueling capable)

**External Stores:** 9,200 pounds (4,175 KG) on seven external store stations; 2- 30mm Aden air-to-air/ air-to-ground cannon; 3- AIM-9 SIDEWINDER infrared heat-seeking missiles; up to four 300-gallon fuel tanks.

**Max Speed (altitude):** 1.12 Mach

### **HARRIER BACKGROUND INFORMATION:**

When a ground commander calls for close air support, he needs it right away. Delays of 30 to 60 minutes could mean the difference between victory and defeat.

To provide flexible, timely close air support to its ground forces, the Marine Corps has turned to V/STOL (Vertical or Short TakeOff or Landing) technology for its close air support aircraft.

No large aircraft carriers or permanent air bases ashore are required for V/STOL operations. All the Marine pilots need are an amphibious assault ship, a clearing large enough for a 72-foot square aluminum mat, a section of two-lane road, or even a damaged 'unusable' airfield.

The combat advantages of V/STOL have been proven by the Marine Corps' AV-8A Harrier, built by British Aerospace. Now the Marines have a much more capable, much more advanced version of the Harrier, the AV-8B HARRIER II, built by McDonnell Douglas Corp.



The AV-8B HARRIER II was designed from the ground up to meet the needs of the Marine Corps ground commander. It can fly distances and carry payloads that are comparable to those of conventional fighter aircraft that must operate from fixed runways.

With AIM-9 Sidewinder heat seeking missiles, air-to-air/air-to-ground cannon, and the unique air combat maneuvering ability inherent in V/STOL aircraft, the Harrier is more than capable of defending itself from the enemy.

If the Harrier pilot encounters an enemy aircraft, he has something available to no other combat pilot--the ability to direct his engine thrust during air combat maneuvering. The Harrier's vertical takeoff and landing ability is due to four nozzles--two on each side of the aircraft--positioned around the plane's center of gravity. These nozzles can be rotated from the full-aft position, for forward flight, to the full down position for vertical operations (hovering), and can be used to make the plane decelerate suddenly in the air, changing the Harrier's pursuer into the pursued when he flies past. The 21,550lb thrust Pegasus engine discharges entirely through these left and right pairs of nozzles fitted with deflectors which turn the flow through approximately 90 degrees. This thrust, when directed downward, will lift the Harrier straight up from the ground. All four nozzles are mechanically linked and actuated by a motor and drive shafts to point in the desired direction. The nozzles (along with attitude control jets) can also be used to pitch the aircraft's nose up when aiming the Harrier's cannon or other weapons.

Control at low airspeeds and during hovering is achieved by the use of compressed-air reaction jets at the wingtips, nose and tail (see drawing, page 11). These jets are controlled by the conventional stick and rudder pedals. When the nozzles are in the vertical position, engine bleed air is ducted automatically to the reaction jets to provide attitude control. The only cockpit control additional to those in a conventional fighter is a lever, alongside the throttle, which is moved to rotate the engine nozzles downward for vertical thrust, to rearward-aft for forward thrust. The technique of variable-thrust vectoring permits both vertical and conventional take-off and landing, or any intermediate degree of V/STOL operation. One unique feature of the Pegasus 11 engine is that some parts rotate clockwise, some counterclockwise to prevent gyroscopic effects that could make the aircraft difficult or impossible to control during vertical operations and the transitions from vertical to conventional flight. This single engine also powers the jet reaction control system which allows maneuvering while the plane is operating at zero airspeed.

In conventional aircraft, the pilot changes direction during flight by moving wing, tail and rudder surfaces. High speed airflow makes these surfaces effective in controlling the aircraft.

On the Harrier, however, there is no high speed airflow when the aircraft hovers. So engineers adapted a system from the space program that enables astronauts to change the attitude of their spacecraft. Jets of air 'bled' from the Harrier's engine are sent through nozzles in the plane's wingtips, nose & tail.



To further reduce pilot workload, a stability augmentation and attitude hold system keeps the aircraft balanced and held during hovers and controls the transition from hover to conventional flight and then back to hover. All the pilot has to do is move the thrust vectoring control down to hover, and the attitude control system will take over and stabilize the aircraft. If the pilot wants to maneuver the aircraft while hovering (under Attitude Control), he simply moves the stick as he would during forward flight and air is released through the appropriate nozzles. There are no special controls to operate. This system is so effective that Harrier pilots can land vertically with their 'hands-off' the control stick.

## GLOSSARY OF TERMS

**ALTIMETER:** A control panel indicator that registers the altitude of the aircraft.

**AILERONS:** Controlling surfaces on the trailing edge of the wing that cause the aircraft to roll (bank) from side to side, and thus rotate on its longitudinal axis.

**AIRFOIL:** The shape of a wing design that produces lift.

**ANGLE OF ATTACK:** The angle of climb (or dive) in relation to the lift of the airfoil.

**AIR SPEED INDICATOR:** Shows the speed of the aircraft registered in knots.

**AIR-TO-AIR MISSILE:** A missile that is fired from one aircraft to seek- out and destroy another aircraft.

**ATTITUDE CONTROL:** Jet reaction control & hold system that allows the Harrier to maneuver during vertical operations (hovering).

**ARTIFICIAL HORIZON:** An instrument that gives a reference bank & pitch indication of the aircraft relative to the ground. Useful when the ground cannot be seen.

**AXIS:** A reference line passing through a body about which the aircraft rotates. eg. X, Y, Z.

**BANK:** SEE ROLL.

**CEILING:** The maximum altitude obtainable by an aircraft.

**COMPASS:** Directional (heading) indicator.

**CONTROL STICK:** Regulates the direction, angle and heading of the aircraft.

**COORDINATED TURN:** Using the rudder and the ailerons simultaneously while turning.

**ELEVATORS:** Control surface areas located on the horizontal stabilizer that increase or decrease the relative pitch of the aircraft.

**FAA:** The Federal Aviation Agency, enforces the utilization of airspace within the United States.

**FLAPS:** Control surface areas that are used to control the lift-airspeed ratio during takeoff or landings. Flaps are not used in this simulation.

**FLARE:** A device that emits an intense heat signal designed to attract heat seeking missiles.

**FLARE-OUT:** A landing maneuver in which the pilot uses the basic glide approach to the landing zone, keeps the nose in a slight upward attitude and places the rear landing gear on the ground first.

**HEAT SEEKING MISSILE:** A missile armed with a device that locates a target by the heat emissions produced by exhaust, or by infrared location.

**HEADS-UP (H.U.D.) DISPLAY:** The visual weapon sight that is displayed on the visor or windshield of an attack aircraft.

**HORIZONTAL STABILIZER:** The aft appendage of the aircraft that houses the elevators and supports the vertical stabilizer.

**LEADING EDGE:** The part of the airfoil that first encounters wind.

**LIFT:** Air force generated under a moving airfoil.

**MACH:** The speed of sound, approximately 740 mph. (Mach 1).

**PITCH:** Movement of an aircraft around its 'X' axis (generally up & down).

**POWERPLANT:** Normally an engine of varying types either jet, rocket, or piston propulsion.

**RATE OF CLIMB:** The amount of vertical distance covered by the aircraft over a given period of time.

**ROLL:** Movement around an aircraft's 'Z' axis.

**RUDDER:** The movable control surface of the vertical stabilizer .

**STALL:** Loss of lift due to low speed or too great an angle of attack or both.

**STOVL:** Short TakeOff or Vertical Landing.

**SURFACE-TO-AIR MISSILE (S.A.M):** A missile that is launched from the ground at an aircraft.

**THROTTLE:** A control device that regulates the amount of power given to a power plant.

**THRUST:** A force or pressure that moves an object in the opposite direction.

**THRUST VECTOR:** The direction of the thrust .

**TOUCH AND GO:** A flight maneuver in which takeoff immediately follows landing.

**TURBOFAN:** A turbojet engine in which a fan supplements the total thrust by forcing air diverted from the turbine exhaust again through the main engine for greater increased pressure.

**VERTICAL STABILIZER:** The fixed vertical top fin assembly that houses the rudder.

**YAW:** A rotation around the vertical ('Y') axis.

**V/STOL:** Vertical/ Short TakeOff or Landing.

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